

Remarks

Claims 1-5 and 7-9 were previously pending in the subject application. By this amendment, the applicants have amended claims 7 and 8. No new subject matter has been added by this amendment. Support for these amendments can be found throughout the specification and original claims. Specifically, support can be found on page 4, lines 6-10 and page 5, lines 1, 2, 8, and 9. Claim 8 has been amended to correct an obvious typographical error. Accordingly, claims 1-5 and 7-9 are now before the Examiner for consideration.

The amendments set forth herein should not be interpreted to indicate that the applicants have agreed with, or acquiesced to, the rejections set forth in the outstanding Office Action. Favorable consideration of the claims now presented, in view of the remarks and amendment set forth herein, is earnestly solicited.

Claims 1-5 and 7-9 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The applicants traverse this ground of rejection and aver that the instant application includes teachings, figures, and representative compounds that fall within the scope of the compounds recited in claims 1 and 7. Not only does the specification discuss common structural and functional features of the antifouling compounds utilized by the claimed invention, the specification also discloses a number of representative compounds that form the basis for the genus cited in claims 1 and 7. The C.C.P.A. has recognized that genus claims can be found in the implicit description provided by representative compounds. *In re Robbins*, 57 C.C.P.A 1321, 1325; 429 F.2d 452, 456-57 (C.C.P.A. 1970).

Specifically, Figures 1A, 1B, and 1C each provide the chemical structure for different, representative compounds that fall within the scope of the genus recited by claims 1 and 7. Clearly, in each specific compound, a pyridyl structure is attached to another cyclic structure at a carbon adjacent to a nitrogen atom. Furthermore, the specification and original claims provide numerous examples of various compounds that exemplify the genus structure claimed in claims 1 and 7. (See page 3, lines 25-29; page 5; lines 24-31; page 6, lines 1-2; Tables 1 and 2; original claims 2, 6, 8, and 22). The applicants respectfully point out that the combined teachings of the figures in combination with the written disclosure of the instant application implicitly support the claimed methods and

compositions. Thus, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §112, first paragraph.

Claims 7-9 have been rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,900,394 to Itabashi *et al.* The applicants respectfully traverse this ground of rejection because the surface treatments utilized in the claimed compositions do not encompass copper sulfate, as disclosed in the '394 patent. Copper sulfate is not a treatment suitable for a surface exposed to an aquatic environment. At most, copper sulfate is a biocide added directly to bodies of water like fresh water ponds to prevent algae bloom. Furthermore, the '394 patent fails to teach that copper (II) sulfate pentahydrate is applied directly to a surface as a treatment. Specifically, copper (II) sulfate pentahydrate is not utilized as a paint, stain, sealant, glaze, varnish, coating, covering, or gloss in any of the embodiments disclosed therein. Instead, the copper sulfate is a source of copper ions (See U.S. Patent No. 6,900,394; column 3, lines 21-22; column 7, line 49). The corresponding sulfuric ions are precipitated out of the plating solution as, for example, calcium sulfate or borium sulfate (see column 4, lines 24-29; 45-52); thus, a copper sulfate compound is not even available for the '394 plating solution nor can it adhere to the '394 wiring boards, which are the target surface of the copper ions. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(e).

Claims 1, 3-4, 7, and 9 have been rejected under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,753,397 to Nakamura *et al.* The applicants respectfully traverse this ground of rejection because the '397 patent fails to teach each and every element of the claimed invention. The '397 patent is directed to anti-fouling resins that utilize boron-containing polymers. Although the polymers disclosed therein may possibly include a nitrogen-containing heterocyclic substituent (See column 4, lines 1-28), the '397 patent fails to teach methods and compositions that utilize the compounds recited in the rejected claims. Specifically, the '397 patent is silent regarding compounds comprising a pyridyl group attached to a nitrogen-containing cyclic group at a carbon adjacent to the nitrogen. In order to anticipate, a single reference must disclose within the four corners of the document each and every element and limitation contained in the rejected claim. *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991).

In this instance, the '397 fails to teach that two cyclic groups are attached at a specific location on the heterocyclic group. In fact, even on the exemplified heterocyclic groups that include more than one cyclic group, the '397 patent fails to implicitly or explicitly teach the claimed position of attachment (*i.e.*, at the carbon adjacent to the hetero nitrogen atom). Accordingly, the applicants respectfully request reconsideration and withdrawal of this aspect of the rejection under 35 U.S.C. §102(c).

Claims 2, 5, and 8 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the '397 patent. The applicants respectfully traverse this ground of rejection because the cited reference does not disclose or suggest methods or compositions having the advantageous properties of the claimed invention. In contrast, for example, the instant application discloses that the specific form of phenanthroline surprisingly impacts the potency of the compound relative to settlement inhibition.

The applicants respectfully request that the evidence provided by the instant application be taken into consideration. According to the Federal Circuit, "... evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratosflex, Inc. v. Aeroquip Corporation*, 713 F.2d 1530, 1538 (Fed. Cir. 1983).

Specifically, the instant application includes evidence that the configuration of phenanthroline unexpectedly and advantageously affects its potency. To that end, the applicants point to Table 1 bridging pages 7-8 of the instant specification. Table 1 provides settlement inhibition and lethal acute dose data for barnacle larvae and crayfish, respectively. One form of phenanthroline—1,9-phenanthroline— inhibits settlement of barnacle larvae at a 2  $\mu$ M concentration. In contrast, another form of phenanthroline—1,7-phenanthroline—fails to inhibit barnacle larvae settlement within the measurement capabilities of the analytical instruments. Furthermore, the applicants provide an interpretation of these test results on page 13, lines 4-11 of the instant application, which is included herein in its entirety:

Various analogs of 2,3'-BP were then tested to determine what molecular features are important for anti-settlement activity. Amongst these compounds 1,9-phenanthroline, a rigid analog containing the "cisoid" conformation of 2,3'-BP, was almost as active as 2,3'-BP. In contrast, 1,7-phenanthroline, a rigid analog containing the "transoid" conformation of 2,3'-BP, was inactive at a 10-fold higher concentration. These differences indicate that the most biologically

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effective conformation of 2,3-BP is cisoid, where the two nitrogen atoms are oriented on the same side of the planar molecule. (emphasis added)

In view of the evidence presented in the instant application and the interpretation provided therein, clearly, the teachings of the '397 patent are empirical and fail to suggest the particular advantageous compound (*i.e.*, 1,9-phenanthroline) utilized in the claimed methods and compositions. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. 103(a) over the '397 patent is respectfully requested.

In view of the foregoing remarks and amendment, the applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

The applicants also invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

  
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